What Is Claimed Is:

1. A method for reducing sensed physical variables including the steps of:

a) generating a plurality of control commands as a function of the sensed physical variables;

b) generating an estimate of a relationship between the sensed physical variables and the control commands, wherein the estimate is used in said step a) in generating the plurality of control commands;

c) sequentially adding a dither signal to each of the plurality of control commands;

d) measuring a response to said step c); and

e) updating the estimate of the relationship based upon said step d).

2. The method of claim 1 wherein the dither signal added to each of the plurality of control commands in said step c) differs for each control command.

3. The method of claim 2 wherein the dither signal added to a given control command includes a triangular signal.

4. The method of claim 3 further including the step of choosing a direction for the triangular signal in order to avoid saturation for that control command

5. The method of claim 1 further including the steps of:

f) holding constant the control command to which the dither is added,

g) updating control commands other than the one to which the dither is added according to the function.

6. The method of claim 5 wherein said step e) is performed only for the control command to which the dither is added.

7. The method of claim 1 further including the step of determining a magnitude of the dither signal based upon a current magnitude of the control command to which the dither signal is added.

8. The method of claim 1 further including the steps of:

varying a frequency of the dither signal to be added to each of the plurality of control commands; and

extracting the information corresponding to each said control command.

9. A method for reducing sensed physical variables including the steps of:

a) generating a plurality of control commands as a function of the sensed physical variables based upon an estimate of a relationship between the sensed physical variables and the control commands;

b) updating the estimate of the relationship based upon a response by the sensed physical variables;

c) determining a magnitude of change over time by at least one of the plurality of control commands; and

d) varying a size of the update to the estimate in said step b) based upon ~~a~~ the magnitude of change over time by the at least one of the plurality of control commands as determined in said step c).

10. The method of claim 9 further including the step of selecting between updating or leaving unchanged the estimate of the relationship based upon a magnitude of change by the plurality of control commands.

11. The method of claim 9 further including the step of:

e) selecting between updating or leaving unchanged the estimate corresponding to a first control command of the plurality of control commands based upon the magnitude of the change in the first control command.

12. The method of claim 11 further including the steps of comparing the magnitude of the change to a threshold and varying the threshold based upon an estimate of a signal to noise ratio.

13. The method of claim 9 wherein the estimate of the relationship is given by $\Delta z = T\Delta u$, where Δz is a change in the sensed physical variables and Δu is a change in the control commands.

14. A system for controlling a plurality of sensed physical variable comprising:

a plurality of sensors for measuring the physical variables;

a control unit generating an estimate of a relationship between the sensed physical variables and a plurality of control commands, and generating the plurality of control commands over time based upon the sensed physical variables and based upon the relationship; and

a plurality of force generators activated based upon said plurality of command signals; wherein the control unit sequentially adds a signal to each of the plurality of control commands, measures the response to the signal and updates the estimate of the relationship based upon the response.

15. The system of claim 14 wherein the signal added to each of the plurality of control commands by the control unit differs for each control command.

16. The system of claim 15 wherein the signal added to a given control command includes a triangular signal.

17. The system of claim 14 wherein the control unit holds constant the control command to which the signal is added and updates the control commands other than the one to which the signal is added according to the relationship.

18. The system of claim 17 wherein the control unit updates the relationship only for the control command to which the signal is added.

19. The system of claim 13 wherein the control unit determines a magnitude of the signal based upon a current magnitude of the control command to which the signal is added.

20. The system of claim 13 wherein the control unit varies a frequency of the signal to be added to each of the plurality of control commands and extracts the information corresponding to each said control command.

21. A system for controlling a plurality of sensed physical variable comprising:

a plurality of sensors for measuring the physical variables;

a control unit generating an estimate of a relationship between the sensed physical variables and a plurality of control commands, and generating the plurality of control commands over time based upon the sensed physical variables and based upon the relationship; and

a plurality of force generators activated based upon said plurality of command signals; wherein the control unit determines a magnitude of change over time by at least one of the plurality of control commands and wherein the control unit varies a size of the update to the estimate of the relationship based upon the magnitude of change over time by the at least one of the plurality of control commands.

22. A system for controlling a plurality of sensed physical variable comprising:

a plurality of sensors for measuring the physical variables; and

a control unit generating and updating an estimate of a relationship between the sensed physical variables and a plurality of control commands, and generating the plurality of control commands over time based upon the sensed physical variables and based upon the relationship; wherein a change in the sensed physical variables Δz is related to a change in the control commands Δu by $\Delta z = T(\Delta u)$, the estimate of a sensed physical variable response T is based on Δu and Δz, and wherein the control unit filters Δu to match a known filter on Δz.